

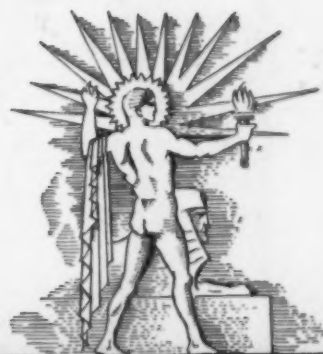
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APR 6 1936

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



APRIL 4, 1936

"Neglected Beauty"

See Page 218

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DO YOU KNOW?

Antarctic explorers find that Little America is afloat on a sheet of ice over 250 feet thick.

Industries that consume the output of platinum include not only jewelry, but rayon, book binding, and electricity.

A survey credits Toledo with a lower crime rate than any other American city of comparable size.

Putting dry ice in rat holes, and stopping up the holes, is being tried in Germany to suffocate rats.

A new breed of pig produced in Germany and pronounced extra-healthy is a cross between an ordinary domestic pig and a fierce wild pig in the Berlin zoo.

The unwrapping of the mummy of an Egyptian princess who lived about 2000 B.C. is shown in a historical film recently made in Egypt.

To withstand hurricanes, houses on the Florida Keys are being built of concrete reinforced with steel, and anchored to the rock under the thin soil.

The blue sheep of China's mountains is a bluish gray animal, with some traits of sheep and some traits of goats.

To make a model of his plow invention exactly the desired shape, Jethro Wood over a century ago whittled his model in potatoes, using up bushels to get results.

A child two to four years old is likely to fight or quarrel with his mates about every five minutes, but the squabble ordinarily lasts only half a minute.

Sixteenth century pharmacists sold no flyswatters, clocks, or flashlights, but their stock included love powders, live toads, and pulverized precious stones.

To help check the spread of fruit tree diseases, millions of sick, wild, and abandoned peach and citrus trees are being uprooted in the southeastern states.

It is so cold on the planet of Neptune that rubber in that frigid atmosphere would be brittle as china, cloth could be broken, and mercury would make good metal for hammers.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

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AVIATION

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PHYSIOLOGY

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PUBLIC HEALTH

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What disease is one of the greatest enemies of public health? p. 212.

TOXICOLOGY

How can physicians tell when a person poisoned by arsenic received his dose? p. 217.

PHYSIOLOGY

Old Age Might be Postponed 15 Years by a Proper Diet

More Calcium, Protein, and Vitamins A and G Would
Prolong the Prime of Life, Rat Experiments Show

OLD AGE can be postponed from 10 to 15 years by eating a diet containing larger amounts of calcium, protein, vitamin A and vitamin G, Dr. Henry C. Sherman, professor of chemistry, Columbia University, stated in a report made at the Carnegie Institution of Washington.

The studies were conducted on rats because the chemistry of rat nutrition is so much like that of human nutrition that the data obtained with rats do not need to be discounted when applied to humans.

The rats were divided into two groups. One group was fed a diet containing enough vitamins and other necessary food substances for the animals to grow, remain healthy and bear young. The second group of animals was given what Dr. Sherman calls an optimum diet, differing from the first

by having more milk in it. The extra milk supplied more calcium or lime, more protein and more of vitamins A and G. The animals on this optimum diet lived much longer than the first group of animals, and in addition had more vitality.

Interpreted in terms of human life, Dr. Sherman said that the gain the rats made was equivalent to extending the span of human life from 70 years to 77 years. The period known as "the prime of life" was extended even more in proportion. Signs of senility that would appear in normal individuals on an adequate diet at 65 years of age would be postponed by the optimum diet to 75 or 80 years.

Dr. Sherman's studies on diet's effect on length of life were made with the cooperative assistance of the Carnegie Corporation of New York and

the Carnegie Institution of Washington.

Dr. Sherman pointed out that among the rats on both diets, as would be the case in human experience, a considerable proportion die natural deaths before the attainment of these ages.

According to present knowledge, Dr. Sherman believes life and vitality could be extended by a moderate increase in the calcium of the diet, by eating not more than twice the minimum amount of protein and by taking about four times the amount of vitamins A and G needed for normal nutrition.

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METEOROLOGY

Air Mass Analysis Demands New Weather Map

A NEW type weather map showing meteorological conditions in three dimensions to an altitude of 16,000 feet has been developed by I. I. Zellon, U. S. Weather Bureau, Pittsburgh.

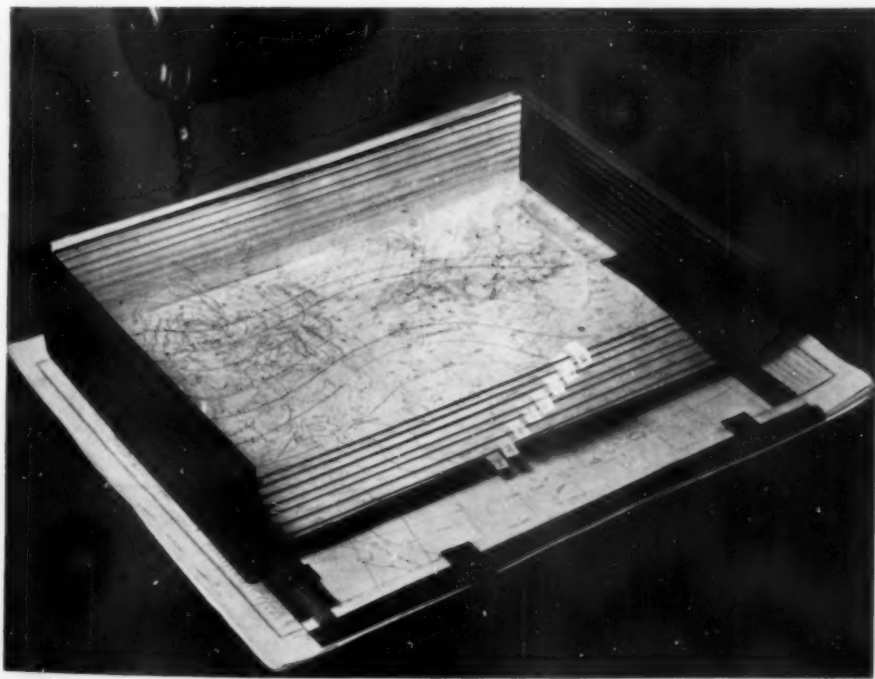
Mr. Zellon's device consists of a small box holding eight glass plates slightly separated. Each plate represents 2,000 feet of height, while the basic ground map below the plates is an outline of continental United States.

The new development is helpful in the plotting of upper air weather information obtained by pilot balloons, army airplane flights and the weather data supplied by airline pilots. This new system of taking weather information is known as air mass analysis because not only are ground data taken but also the nature of a cross-section of the upper air determined.

Fast-drying opaque inks of different colors are used for plotting the various aerological data; wind velocity may be red, pressure blue and so on.

Says the government weather scientist:

"The meteorologist will find that he can rather quickly plot on these panes the data from the pilot balloon and airplane stations, adding the analysis of fronts and air masses, for each 2000 foot level. By looking down through the series of plots a graphic picture of the synoptic situation in three dimensions can be gained. Although this gives a somewhat cruder representation of the upper air, in some respects, than a carefully drawn cross-section, it has the advantage of giving three dimensions rather than two, and of being more legible and intelligible to one not a technician in modern aerological an-



THREE-DIMENSIONAL WEATHER MAP

This new type weather map in three dimensions is one on which forecasters plot weather data obtained for different altitudes above the earth, in addition to the usual ground data. Each glass plate represents 2,000 feet of elevation.

alysis. Airplane pilots in particular can learn to read more readily from the mapping frame than from the ordinary surface map or cross-section the information they wish to know; it should

be better in this regard than a series of upper air maps laid side by side, if the glass frames be large enough, well drawn and properly illuminated."

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PUBLIC HEALTH

New Surgeon General Plans Vigorous Health Program

Wiping Out Tuberculosis and Syphilis Heads List Of His Goals; National Health Insurance Not Approved

HEALTH insurance for the nation as a whole does not meet with the approval of the newly-appointed Surgeon General of the U. S. Public Health Service, Dr. Thomas Parran, Jr.

"I am convinced," he said recently, "that an integrated plan of public health, public medical service and private practice is preferable to health insurance."

This statement was made on methods of securing health for the people of New York State while Dr. Parran was Health Commissioner of that state. Under his direction a system was built up for securing adequate medical treatment for all the people without recourse to health insurance. Here is how it works in the case of pneumonia, for example:

The practicing physician sees his patients and takes care of them himself. For those patients who have only a little money to spend on medical care, the state health department makes free tests of the patient's serum to determine the type of pneumonia he has. A new, better, concentrated serum, costing at retail from \$20 to \$100 per patient, is supplied without charge by the state department of health to any physician requesting it. In addition, the state health department, either through its own nursing service or through other nursing agencies, supplies nursing service free of charge to all patients who are being treated in their own homes instead of in hospitals.

Post-Graduate Training

Another feature of the New York plan is that the State medical society volunteers to give its own members up-to-date, post-graduate training in the treatment of pneumonia. Deaths from pneumonia will, according to conservative estimates, be cut down by at least

one-fourth within the course of a few years of this concerted effort on the part of public health and private medical agencies.

Dr. Parran believes this system should be extended to other kinds of illness and to other states. It is not state medicine, for the private physician takes care of his own patients. The states merely extend their health service to include laboratory tests, treatment materials and nursing service for those private patients who cannot bear the cost of these in addition to the doctor's fees.

"Under such a combination, the doctor would retain everything now satisfactory to himself and his patient," Dr. Parran points out. "He would be aided by public accessories to practice and by compensation for the present unbearable load of free service; there would be no disruption in the physician-patient relationship for the large sector of medical practice in the home and in the doctor's office."

"For those above the job insurance level there would be no change in present methods."

Evolutionary Process

"This plan would represent an evolutionary process based upon considerable experience. It would provide care freely for the catastrophic and expensive illness of the low-wage group now poorly served or served at the expense of the physician. It would remove the major economic hazards of illness. It would reduce present high disease and death rates from important preventable causes and advance the public health tremendously."

The American people may as well get ready to take syphilis out of the category of unmentionable, darkly whispered words and put it into everyday speech along with gallbladders,

cancer and infantile paralysis. For they are likely to hear a lot about syphilis from the newly-appointed Surgeon General.

Syphilis is a disease which Dr. Parran considers one of the greatest enemies to public health. (See *SNL*, Mar. 21.) In this several thousand other health and medical authorities agree with him. For years Dr. Parran has been active in the fight against this health menace.

When you meet Dr. Parran, he will impress you as a forceful person, keen of thought, independent, a fearless fighter against all diseases and conditions that are unfavorable to health.

Dr. Parran is a young man to shoulder the responsibilities of his new position—he was born in Leonardtown, Md., in 1892—but he has had extensive experience in administrative public health work. His academic training was received at St. John's College, Annapolis, Md., and he received his medical degree from Georgetown University, Washington, D. C., in 1915. He entered the U. S. Public Health Service in 1917, winning first place in a competitive examination for entrance.

Since entering the federal health service he has served as medical officer in charge of Muscle Shoals Sanitary District and chief medical officer at the government nitrate plant; as state director of rural sanitation in Mis-



DR. THOMAS PARRAN, JR.

"Musts" on Health Program Of New Surgeon General

The newly-appointed Surgeon General of the U. S. Public Health Service, Dr. Thomas Parran, Jr., has six "musts" on his program for securing better health throughout the nation, based on his philosophy that "the greatest need for health action is where the greatest saving of life and suffering can be made." They are the following:

- 1. To finish the job of wiping out tuberculosis.
- 2. To wipe out that unmentionable disease, syphilis, the end results of which "crowd our jails, our poorhouses and our insane asylums."
- 3. To make available to people everywhere facilities for the proper diagnosis and treatment of cancer, which in Dr. Parran's opinion would reduce by 20 per cent. the deaths from this disease.
- 4. To reduce the "disgracefully high" death rates of mothers in childbirth and of babies in their first month of life.
- 5. To correct the conditions resulting from improper diet.
- 6. To restore crippled children to lives of usefulness.

souri; in charge of the Tri-State Sanitary District of Kansas, Missouri and Oklahoma; and as director of county health work in Illinois. For four years he was assistant surgeon general in charge of all venereal disease control activities of the U. S. Public Health Service and during this period inaugurated many important research studies on these diseases.

When President Roosevelt was elected Governor of New York State in 1929 he desired a reorganization of the health department of that state. A request was made to the Surgeon General of the U. S. Public Health Service

for the assignment of an experienced, capable officer. Dr. Parran, because of his unusual experience, was selected for the assignment, and his outstanding record as State Commissioner of Health of New York for the last five years has justified this assignment and promises much for his future as Surgeon General of the U. S. Public Health Service.

Dr. Parran has been called the foremost authority in the country on the public health aspect of syphilis control, but he has also taken an extensive interest in rural health work and in fact in all problems affecting the public health.

Science News Letter, April 4, 1936

PUBLIC HEALTH

United States Lags In Fight Against Smallpox

By DR. J. P. LEAKE, Medical Director,
United States Public Health Service.

SSMALLPOX should be an unknown disease. It is certainly the disease most completely preventable by the "defensive armor" of making people immune to attack.

We have to admit, however, that the United States lags behind other civilized countries in vaccination protection.

Doctors have commented on the fact that a medical student may go through four years of training in a city which has fair vaccination protection and a good health department, without ever

seeing a smallpox case. In parts of the country where vaccination is routine, smallpox is uncommon.

Yet, from 5,000 to 50,000 cases of smallpox occur each year in this country.

Effectiveness of vaccination against smallpox is demonstrated by experience. Time after time, health officers actually responsible for repression of smallpox find households, jails, and institutions with a large proportion of the unvaccinated attacked by smallpox, and the recently vaccinated spared. This is practically uniform experience.

To show how commonplace small-

pox used to be, it is said that if the police wanted a man, the fact that his face was not scarred and pitted by smallpox would be an outstanding mark for finding him. Smallpox was almost as common, before vaccination was introduced, as influenza is today, and far more deadly.

The work of eighteenth century doctors and others, who developed the means of preventing this disease, provide one of the classic stories of medical history.

A child should be vaccinated within a few weeks after birth, when the effects are mildest. Then, the child should be revaccinated when he starts to school. And thereafter it is best to be vaccinated again every five to twenty years.

If this is done, the individual will practically never have a sore arm from vaccination, and will always have the best possible protection against a disease which may be very dreadful.

Science News Letter, April 4, 1936

ARCHAEOLOGY

Etruscans Did Not Figure In Direct Descent of ABC's

THREE inscriptions by the ancient Etruscans, preserved in New York and Philadelphia museums, are helping to clear up one of the puzzles of how the alphabet was evolved.

The three pieces of writing, now among museum treasures of this country, suggest strongly that the Romans got the alphabet direct from the Greeks.

This has been one of the weak and uncertain links in the long chain of evolution through which scholars trace the modern alphabet. From modern letters—in which this magazine is printed—the evolutionary changes go back through Latin alphabet, Greek forms, Phoenician, even farther back toward a still somewhat mysterious origin, perhaps near 2000 B.C. in the Near East.

For many years, language students have argued over two rival theories as to where the Latin alphabet was borrowed. One faction said the Romans caught the idea from Greek colonists in southern Italy. Another faction thought that Rome's near neighbors, the Etruscans, were the people who gave Rome inspiration for an alphabet.

Now, it appears that the Etruscans can be left out of the alphabet picture in this direct line of succession.

The Etruscans, who rose to power in Italy about 800 years before Christ,

have proved one of the most baffling of ancient peoples to understand. The beauty of their bronze craftwork and their other possessions, and their alphabetic writing—which is still incompletely understood—have lured scholars to try persistently to learn more about Etruscan civilization. A new bit of information about a single Etruscan alphabet letter is apt to be heralded as news of importance.

Dr. Eva Fiesel of Yale University has been studying three Etruscan inscriptions at the Metropolitan Museum of Art in New York and the University Museum in Philadelphia, and she has learned something new about the letter X in Etruscan. This letter has heretofore been recognized in its place

in the Etruscan alphabet, which, by a curious Etruscan custom, was often inscribed on vases or other objects. But how the letter X sounded in Etruscan words no one could say.

From the three American inscriptions, Dr. Fiesel finds evidence that early Etruscans before 600 B.C. pronounced X as S or Sh, or in some similar way. This pronunciation ties the Etruscans, by language, to ancient Asia Minor, suggesting that the Etruscans brought their alphabet with them when they migrated to Italy. At the same time, it suggests that the Latin alphabet was borrowed elsewhere, for in using this strategic letter X the Romans gave it a sound value familiar to Greek colonists in Italy.

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PHARMACY

Vitamin Experts Confer on Standard for Vitamin B₁

THE NATION'S vitamin experts recently sat around tables in a hotel room in Washington, D. C., for an entire morning and attempted to draw up a standard for one of the B vitamins to put in the next revision of the U. S. Pharmacopoeia.

This volume is the legal standard in the United States for medicines. It is revised every ten years by a committee of physicians, pharmacists and other medical scientists. It is instrumental in preventing the sale of inferior medicines to the public.

The revision committee of the Pharmacopoeia called in the leaders in vitamin research to give advice on which method of determining the presence of vitamin B₁ in food and drug products should be made the official standard. Sitting in at the conference was Dr. Katherine H. Coward, one of England's leaders in vitamin research.

A tremendous number of food and drug products, claiming to be of health value because they contain vitamin B₁, are now on the market. At present there is no way for a physician to be sure which of these is best for his patients, because there is no standard to judge them by.

Since the original discovery of vitamin B and its importance for health, scientists have found that there are some four or five, or maybe six B vitamins. All of them are necessary for health. One of them prevents pellagra.

Others have other effects on the body. The one chiefly discussed, known as B₁, protects against nervous ailments and particularly against the serious disease, beri-beri. It is found most abundantly in whole grain cereals (refining or polishing removes it), in yeast, egg-yolk and liver.

Standards for vitamin B₁, unlike standards for chemical medicines, depend on animal studies. Scientists may test for B₁ by determining the amount of a vitamin-containing substance, such as yeast or rice polishings, that will cure beri-beri in a pigeon or in a rat, or the amount that will promote normal growth in the animal or bird.

The experts meeting here agreed that it would be helpful for the U. S. Pharmacopoeia to recognize one method of determining vitamin B₁, but that it should not be made the legal standard until it had been tried generally by vitamin researchers and manufacturers of vitamin products. They seemed to favor using pigeons for test animals. Yeast as a test material was not favored because it contains too many of the other B vitamins which might interfere with the results.

The consensus of opinions expressed will be used to guide the revision committee in deciding whether to adopt a vitamin B₁ standard for inclusion in the U. S. Pharmacopoeia. Physicians, general public and manufacturers will all benefit from such a standard.

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ORNITHOLOGY

Mallard Duck Built Nest In Tree Instead of Grass

By GEORGE A. SMITH

SPRING is here, and the wild ducks are coming back. And I am wondering whether the pair of mallards I got acquainted with last spring will repeat their strange behavior, and build another nest in a tree.

One morning early in the season, while taking a walk along the shore of Jones Lake, just south of the New York State Fish Hatchery, Cold Spring Harbor, Long Island, New York, I noticed a mallard duck fly out of a tree. Knowing that mallards seldom alight on trees, I guessed that the duck had built her nest in it, so I climbed the tree to satisfy my curiosity.

On an overhanging branch about ten feet from the ground, directly over a path, and only a few feet from the lake, I found a nest lined with down and containing nine duck eggs. It is rather uncommon for mallards to build nests in trees. They often lay their eggs and hatch their young in a field, or even close to a thoroughfare, or in some secluded spot in a park, but the nest is usually on or near the ground or in very low bushes.

I watched the eggs every day or two until the young ducks hatched. The



A HIGH HOME

These mallard duck eggs in the nest were found on a tree branch ten feet above the ground where this kind of bird usually builds its nest.



UNUSUAL MOTHER

The shy bird that has turned its back on the camera is a Mallard duck, found nesting on this high branch.

first week of nesting the mother would leave the nest whenever anyone came near, but later she would stay until I approached within eight feet. After leaving the nest the mother mallard swam around the lake, appearing indifferent, even to crawling on the bank to sun herself and to preen her feathers. However, she would not return to the nest until she was sure that no one was near. Then she would fly to the ground, just below the nest, and look all around, before flying to a nearby branch to sit awhile before cautiously approaching the nest to sit on the eggs.

I visited the nest at 3 P.M. on the day before the eggs hatched, and noticed that only one egg was cracked. When I picked up this egg the duckling was squirming in the shell. Upon returning the following day at 1 P.M.,

the baby ducks were out of the nest and swimming about in a small ditch of water beneath the tree. Five of the eggs had hatched.

As I approached the mother and her brood, the young ones scurried for cover, while the mother flew a short distance out over the lake and tried to distract my attention from her babies by screaming and flapping her wings, doing a tail-skid along the top of the water and pretending she was injured.

I gathered the five downy ducklings together and after photographing them put them into the water so that they could swim to their mother, who was now about 30 feet from the shore. Immediately one of the little ducks dived from sight and swam under water for about six feet.

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drinking. As little as one part per million of fluorine in the water will cause the condition, for which there is no cure. So far, there has been no practical preventive either. A few communities have been able to solve the problem by changing water supplies, but most communities where the water supply is high in fluorine content are located in the arid Southwest where there is no other water available.

Working with rats, Dr. Sharpless found that he could prevent the dental condition resulting from fluorine by adding aluminum chloride to the animal's diet. The result is achieved by a chemical reaction in which the aluminum combines with the fluorine to make a compound, aluminum fluoride. Aluminum compounds are not absorbed by the rat, so when the fluorine enters into compound with the aluminum it is eliminated from the body without getting a chance to harm the teeth.

Other substances that form insoluble compounds with fluorine were tried but were ineffective.

Science News Letter, April 4, 1936

NUTRITION

Spinach Not So Healthful As Has Been Supposed

GOOD NEWS for spinach-haters! The leafy vegetable, obnoxious to many and unwillingly eaten because of widely heralded health value, is losing its high standing, discussions at the opening session of the American Institute of Nutrition revealed.

Spinach has been considered a valuable food because it has a high content of blood-and-bone-building iron and calcium. Less than half of the iron content of spinach, however, and less than a third of its calcium are in a form that can be used by the body, it appears from a report by Drs. M. K. Horwitt and G. R. Cowgill of research made by them at Yale University with the late Prof. L. B. Mendel.

Similarly, the amount of protein available for human nutrition is not what would be thought from the amount found in spinach by analysis.

In their research, the Yale investigators devised a method which in the future can be used for determining in other foods besides spinach the amount of nourishing substances actually available to the body, as compared with the amount theoretically available as judged by the total content of these substances found in foods by analysis.

Science News Letter, April 4, 1936

MEDICINE

Study May Make Possible the Prevention of Mottled Enamel

AWAY to prevent the dental condition known as mottled enamel which has disfigured thousands of children in the Southwest and certain other parts of the country was suggested by Dr. George R. Sharpless of the Henry Ford Hospital, Detroit, at the meeting of the American Institute of Nutrition.

If the human body reacts toward aluminum compounds as the rat's does,

a preventive for the disfiguring tooth condition may have been found. All that would then be necessary would be to add the right amount of aluminum chloride, which is a salt, to the diet of infants and children in regions where the water supply is high in fluorine content.

Mottled enamel is caused by fluorine in the water used for cooking and

PHARMACY-PUBLIC HEALTH

Suggest Sterilizing Doctors' Prescriptions

A HEALTH hazard in the germs carried on doctors' prescriptions is reported by Dr. B. Kosowski of Warsaw. (*Pharmaceutical Journal of London*, 1935, p. 135.)

Dr. Kosowski found that there was a marked difference in the dangers, depending upon the kind of paper upon which the prescriptions were written.

Straw cellulose paper carried more germs than wood pulp; paper with gelatin and starch as an ingredient was distinctly favorable to the growth of micro-organisms; but if vegetable mucilage was an ingredient the micro-organisms did not thrive.

He examined 360 prescriptions, which he had collected from various pharmacies in Warsaw and found they were all contaminated with various dangerous organisms. For this reason he considers them a distinct health hazard and suggests that every one should be sterilized when presented to the pharmacist. To facilitate this sterilization he has invented a small machine consisting of two cylinders, which can be heated by electricity to 200-220 degrees Centigrade. The slips are inserted in the rotating apparatus and come out fully sterilized.

Science News Letter, April 4, 1936

AVIATION

"Silent Siren" Warns Pilot of Fire in Air

FIRE in the air—rare but nevertheless always dreaded by airplane pilots—is immediately detected in any part of a plane during flight by a novel detection system involving the use of a "silent siren" described in a U.S. patent granted to Henry E. Heigis, West Orange, N. J., inventor.

Mounted in its watch-like, glass-covered case on the instrument panel of the plane where the pilot can readily observe it, the siren, which is really a miniature windmill, spins around in a blur of color to give instant, visual, but silent warning in case a fire breaks out. Having a head start on the fire, the pilot can then train extinguishers on the blaze.

The siren spins into action when "heat actuators," valve-like devices placed at points in the plane where fires are most likely to occur, as near the carburetor, oil pump and engine, open

up when heat contacts them. These actuators are connected by a pipe to a nozzle which is directed against the blades of the siren. There is also a second pipe connected to the siren case, which leads to a suction-creating device such as the intake manifold of the airplane engine.

This set-up causes the siren to be under constant suction, but because the heat actuators or valves are normally closed, no air can flow through the system and therefore, the siren does not spin to warn the pilot. In case of fire, on the other hand, the valve nearest the fire opens and air is immediately sucked through it, into the first pipe, then out of the nozzle against the siren blades, spinning them around. The whirling blades catch the eye of the pilot.

Science News Letter, April 4, 1936

PHYSIOLOGY

Effect of Excitement On the Blood Is Reported

THE SPECIFIC gravity of blood is greater during excitement than when one is calm, and the spleen, a red blood cell factory in the body, is partially responsible, experiments by Drs. L. B. Nice and H. L. Katz, of Ohio State University, show. Specific gravity gives the weight of a unit volume of blood or other fluid compared with the weight of the same unit of water.

The two scientists have been studying the effects of excitement on rabbits and cats. In normal animals the increase in specific gravity of the blood after they had been excited was quite marked, but in rabbits whose spleens had been removed this increase was much smaller.

The experimenters ascribe their results to the removal of water by body tissues from the blood, the addition to the blood of the waste products of the animal's speeded-up life processes, and, most important, the actual contraction of the spleen to force red blood cells into the blood stream.

Since the red blood corpuscles carry oxygen from the lungs to points where it is needed, this makes more oxygen available to the muscles, nerves, and glands so that it is possible to act more quickly and more forcibly in response to whatever it is that is producing the fear, rage, or other emotion.

Studies showing the same effect of excitement on the blood of pigeons were reported by Dr. Nice and Dr. D. Fishman at the meeting in Washington of the American Physiological Society.

Science News Letter, April 4, 1936

IN SCIENCE

MEDICINE

Massage and Weak Electric Current to Revive Heart

A METHOD of reviving hearts, that should prove valuable in surgical operations on the heart, was reported by Dr. C. J. Wiggers, Western Reserve University School of Medicine, at the meeting of the American Physiological Society.

The method makes use of massage and a weak electric current. Both of these have been used before to revive hearts, but the new and important point reported by Dr. Wiggers is the order in which the two procedures are carried out. Massage first, then use counter-shock, Dr. Wiggers advises.

Passing an electric current of about one ampere strength through a heart that is fibrillating will stop the useless twitching of single muscle fibers known as fibrillation and make all the fibers contract together in a beat strong enough to pump the blood out into the body. This was found by other scientists in previous research. The method, known as counter-shock, has been used to revive animals shocked by low-voltage electric currents, which are one factor that causes fibrillation.

Dr. Wiggers and associates tried the electric shock method of reviving hearts that were fibrillating because of stoppage in the heart arteries. They found that the method worked, provided the stoppage of the artery was removed and the fibrillation had not lasted more than 2 or 3 minutes. After 5 to 8 minutes of fibrillation, the electric current did not stop the fibrillation and revive the heart even when massage of the heart and stimulating drugs were tried.

By massaging the heart before rather than after passing the electric current through it, Dr. Wiggers was able to revive 40 out of 47 dogs whose hearts had been fibrillating for as long as 5 to 7 minutes. No drugs or chemicals were needed.

"The method should prove of value in revival of exposed human hearts that fibrillate accidentally during the course of cardiac operations," Dr. Wiggers stated.

Science News Letter, April 4, 1936

NEW FIELDS

PHYSIOLOGY

Prescribe More Vitamin D For Babies Than Is Needed

THE AMOUNT of rickets-preventing vitamin D usually prescribed for babies is more than they actually need, Dr. Frederick F. Tisdall, of the University of Toronto, pointed out to the American Institute of Nutrition.

On the other hand, even the so-called "good diet" may not contain as much vitamins A and B as it should, Dr. Tisdall indicated. The idea seems to be that while the child may be getting along on the amount of the A and B vitamins in a "good diet," he would do much better if he were fed a diet containing more of these vitamins—what Dr. Tisdall called the optimum amount.

Studies on humans show, he said, the need for further investigation of the present dietary standards in childhood, with a view to revising these standards.

A satisfactory method of estimating the child's vitamin C requirements has not yet been found, he observed.

Science News Letter, April 4, 1936

CHEMISTRY

New Section of American Chemical Society Formed

A NEW section of the American Chemical Society dealing with microchemistry has been formed, it is announced by the Society. Prof. A. A. Benedetti-Pichler, of Washington Square College, New York University, has been appointed section chairman.

Fresh advances in microchemistry, "the detective of science," will be stimulated by organized national activity, Prof. Benedetti-Pichler predicted. Micro-procedures, he pointed out, are of growing importance in the industries, in medicine, in the detection of crime and art forgeries, in revealing the presence of precious metals in nature, in the study of sex hormones, and in many spheres of fundamental scientific investigation.

"Today there is hardly a branch of chemistry or biology which has not already derived benefit from the use of

microchemical methods," Prof. Benedetti-Pichler said. "Microchemistry has made it possible to study the physiological functions of small animals, even of insects. Not only an individual cell but even parts of cells have been analyzed by Linderstrom-Lang and Holter.

"Microchemical methods have enabled the laboratories of hospitals to carry out complete blood analyses on a few drops, whereas formerly quantities up to three and five ounces had to be taken for this purpose. With the old methods the repeated removal of large quantities of blood was objectionable to the diagnostician and sometimes even endangered the life of the patient.

"Microchemical procedures have furthered the isolation of insulin; the synthesis of haemin, which is the principal constituent of the blood dyestuff, and of chlorophyll, the dyestuff of plants; and study of sex hormones."

Science News Letter, April 4, 1936

MEDICINE

Suggests Reason Why Anemia Follows Infection

THE ANEMIA which frequently follows infections may be due to a disturbance of internal body processes which puts a check on production of hemoglobin, the oxygen-carrying red coloring matter of blood. Studies indicating that this is the case were reported by Dr. F. S. Robschey-Robbins, of the University of Rochester School of Medicine, to the American Society for Experimental Pathology.

Dr. Robschey-Robbins' studies seem to clear up a long-standing medical puzzle. Heretofore it has been generally believed that lack of absorption of blood-forming substances by the body as well as destruction of blood during infection were responsible for the anemia.

An accidental infection in dogs that had been made anemic by being bled gave Dr. Robschey-Robbins a chance to investigate the problem. He found that infection and intoxication both markedly impaired blood formation.

Further studies with other animals showed that actual blood destruction is not part of the picture and that lack of absorption of blood-forming substances can also be definitely ruled out. That leaves failure of blood production as the explanation of the anemia, and the studies suggest. Dr. Robschey-Robbins said, that the failure is due to some disturbance of internal body processes connected with food utilization.

Science News Letter, April 4, 1936

ARCHAEOLOGY

Mayan Pyramid Like Nest Of Blocks Is Found

A NEST of three pyramids built by the ancient Mayan Indians near Guatemala City has been discovered by an expedition from the Carnegie Institution of Washington, led by Dr. A. V. Kidder.

The discovery was made when the expedition drove exploratory trenches into a mound at Miraflores, thought to contain ruins of importance. The pyramid, which is the first pyramid archaeologists have ever found in Guatemalan Highlands, was twice enlarged, leaving the older structure inside like a child's nest of blocks.

The trenches have reached the innermost of the stucco-covered step pyramids, finding it well preserved, with walls and stairway.

The site is being excavated on request of the Guatemalan Minister of Education, Senor Villacorta, who is an archaeologist. Dr. Kidder believes that mountain valleys of the region may reveal remains of Indian groups which preceded the great Mayan civilization and laid foundations for its wonderful achievements.

Science News Letter, April 4, 1936

TOXICOLOGY

Physician's Finding Gives New Clue in Poison Cases

A NEW clue in cases of arsenic poisoning which tells criminologists approximately when the poison was administered was reported by Dr. R. A. Mees, of Wageningen, Holland.

The clue is found in the condition of the nails in arsenic poisoning. Dr. Mees says that in patients with polyneuritis brought on by the injection of arsenic, he found that about six times as much arsenic was in the transverse striae of the nails as in the normal nail substance. If but one or two doses had been taken the arsenic zone was clearly defined but if more had been taken the zone was more diffused. He has calculated the approximate time it takes for this arsenic zone to make its appearance after the arsenic is taken.

Physiologists say that the nail grows at about the rate of one-thirtieth inch a week on the finger and about one-fourth as rapidly on toes. By using this rate and the position of the arsenic zone, criminologists have a clue as to the time the poison was administered.

Science News Letter, April 4, 1936

BOTANY

Beauty Unseen

Scientist-Photographer's Patient Skill Shows Us Treetop Flowers We Usually Pass by Without Noticing

By DR. FRANK THONE

See Front Cover

THE FLOWERS that bloom in the spring, to most of us, are the same flowers that as children we eagerly gathered in woods or Grandmother's garden—violets and buttercups, daffodils and tulips. Big, bright, brave blossoms, that are pleasant to look at and easy to see.

Yet the woods in spring are full of other blossoms, that most of us never take the trouble to look at, but that nevertheless are of surpassing beauty if we were not still as much in a hurry, and as little in patience, as the children we once were. The tiny flowers of the trees are almost ignored.

To be sure, we do take note when the maples break into blossom on the first warm day, encouraging the first venturesome bees. We know, too, in a hazy sort of way, that the pussy-willow is the willow-tree's flower. But if some one asked us to bring him a single flower of maple or willow, we would be very likely to bring a whole bunch of them—for they come in clusters, and the individual flower is too small to make much of an impression on the unaided eye.

There is a good deal to be said for an old-time naturalist's declaration that everybody ought to carry a strong pocket magnifying glass all the time, to give him new pictures of the world he walks through every day. We could count ourselves better educated and more civilized, if we did so.

Need Interpretation

But even the best of pocket magnifiers would fail to give whole views of many things; their field is too limited. Also, many of the things we see, whether with the naked eye or with an enlarging lens, need interpretation unless we are veteran naturalists ourselves.

A satisfying and beautiful compromise, bringing the beautiful, tiny, enlargement-needing flowers of trees to us and offering with them brief but adequate interpretations, has just become available in a book that is at once

an artistic feast and a botanical education. It was written and published by Prof. Walter E. Rogers of Lawrence College. He has called it "Tree Flowers of Forest, Park, and Street."

The outstanding feature of the book, its real reason for being, is the collection of many scores of tree flower photographs, most of them enlarged many times to bring out their inconspicuous but delicate beauty, exquisite beyond all telling. With each, Prof. Rogers puts a couple of paragraphs of compact descriptive text, and on the back of the page is a black-and-white silhouette of the whole tree, done by Olga A. Smith, another member of the Lawrence College botanical faculty. These, with sensitively executed marginal drawings, achieve an apt blending of science with art, to the benefit of both.

One of the first lessons one gets, on examining pictures of the earliest tree flowers that open in spring, is the beauty that can be achieved in nature by the right arrangement of the barest

biological necessities. For many of these flowers, such as willow, poplar, elm, and so on, dispense altogether with the bright collar of petals that is the "flower" to most of us. Yet, even before they open at all, they have beauty. The varnished bud on a willow twig, as enlarged in one of Prof. Rogers's photographs, has all the shapely, shining beauty of an ancient bronze spear, and it looks as ready and purposeful.

As these unadorned flowers open, for their pollen-traffic in the uninfested air, they disclose new beauties. One is taken especially with the repetition of what might be called the vase motif: everywhere one finds this shape, with swelling body, tapering neck, and frequently what looks like a pair of plumes thrust into the top. Flowers on the black-walnut tree, for example, show this arrangement to perfection.

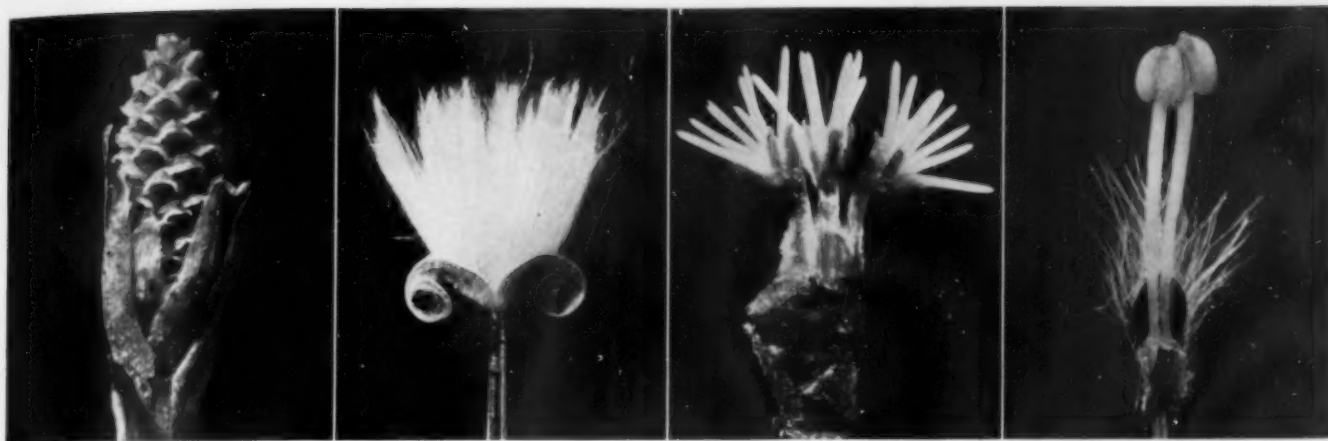
Those little vases are the abodes of life itself, the hope of the coming generation of the species. For they are the essential parts of the pistillate or female flower. In them the seed will be formed and matured; their plumes bear the receptive surfaces that await the coming of the wind-borne pollen.

On separate trees, or sometimes in separate flower-clusters on the same



PROF. WALTER ROGERS

He who sees beauty in tiny, ignored things: with one of his simpler camera set-ups. In the sand-filled tumbler, he is carefully maneuvering a tiny flower into position for picturing.



tree, are the pollen-bearing staminate or male flowers. Always these hold up on longer or shorter stalks what look like thickish twin sausages. These are the anthers, packed with yellow pollen that will presently drift down the wind. Millions of grains will be lost for every one that reaches its biological destination; it is a very wasteful process. Yet the world remains filled with trees, and the supply of seedlings does not fail. Even inefficiency sometimes suffices.

Opening Bud Photographed

The opening of a bud filled with these flowers, male or female, is a fascinating thing to watch, if you have the time and patience. The scales that have protected it all winter unclasp so slowly, deliberately; the flowerparts within, huddled and cramped for economy of room, rise and stretch as though they were actually relieving muscles held too long in one position. Prof. Rogers shows this remarkably effectively in more than one series of photographs.

Sometimes the flowers will achieve so bizarre an appearance that one might accuse them of being the work of a cartoonist, or miniature medieval gargoyles. A single male flower of a willow, for example, has the look of a fantastic little beastie with big solemn black eyes, wild white bristly hair standing on end, and a pair of club-ended horns rising from its nose.

Fantasy often goes with beauty, as in the male and female flowers of the hemlock. The male flowers are arranged in an evanescent little cone at the end of a twig. It stands on a tiny little stalk of its own, like a tiny tree of shells or bells. In the enlarged picture, the short needles of the hemlock thrust out around it like broad-bladed

protecting swords. The female flower-cone, also tipping a twig, might be mistaken for a carefully made model of a rose, by a Japanese artist. This flower will remain, to become the tiny brown cone of the hemlock when its treasured seeds ripen.

Other cones Prof. Rogers displays in his book: fir and spruce, pine and tamarack. It is difficult to grasp that structures so rough and scaly in their maturity should be so delicate and tender when they are young. The infant white-pine cone, for example, half-embraced among the soft leaves of the twig-tip, somehow reminds one of a fawn. For good measure, Prof. Rogers throws in a picture of more mature cones, especially a group on a balsam spruce—smooth, symmetrical, close-scaled like beautiful tropical fish. Not all grown cones are rough.

No Bright Petals

Most of these beauties are achieved without any of the things we consider necessary to beauty in flowers—bright petals, and other colored parts of the floral envelope. True, some of the maples have a delicate little circle of what most of us would call petals. Really they are sepals—but that is a difference for botanists to bother about. However, even among the maples, most of the species get along without these trimmings.

Yet it must not be imagined that the tree flowers that bloom in the spring are all of them unadorned. Plenty of them have their petal frocks, even though these may not be so long and wide as those tree-flowers we know most easily—magnolia, hawthorn, and dogwood. Tiny though these lesser tree-flowers are, they have grace and beauty of their own, which quickly becomes apparent when we look at some of the

BEAUTY OF THE TREETOPS

On the left is the young cone of the white pine, next the fruit of the willow tree looking like spurting white flame, then three chestnut flowers and finally the male flower of the willow.

enlargements made by Prof. Rogers.

We ordinarily look for beauty in the holly along about Christmas time. But in its time of blossom it also has its attractiveness. The berry-bearing tree produces a multitude of tiny white flowers, each with four petals, and in the midst the pistil, or fruit-forming part, that will eventually swell into the big red berry. But now it is shaped like a short, lidded Japanese vase, and is green. It will not redden until autumn.

Around the pistil there are four stamens, so that at first we might think that here we have what botanists call a "perfect" flower, that is, having both male and female parts in one. But a closer look at the stamens shows that they have no pollen—none of the vital golden dust bulges their ends. They are sterile—evolutionary leftovers, like our own tonsils and appendix. The real male flowers are on a holly tree somewhere else, that never has berries.

Sassafras

One-sexed also are the flowers of the sassafras, borne on separate trees. But the stamens are big and husky, and there is a big family of these brothers—nine of them—surrounded by six things that most of us again would call petals, of a not unattractive yellowish green. There is something irresistibly rural about the sassafras flower—like the tea that is made from the bark.

Sometimes the showiness of petals is attained by parts of the flowers' vital organs themselves. The triple pistil of

the female chestnut flower, for example, divides in its upper portion into six waxen tapers that spread out like fingers. Three of these tiny "hands," in an attitude of supplication, are shown in Prof. Rogers's book—a not inappropriate suggestion, considering how a fungus plague has all but wiped the chestnut out.

Beauty in Clusters

Sometimes the best effect of the little flowers is obtained, after all, when they are in their natural clusters. A striking example of that is the picture of the flower of the button-bush. Each flower of this water-loving shrub is a tiny trumpet with a long column (part of the pistil) sticking out. United at a single point by their lower ends, they form a compact shining ball with rays protruding on all sides, like a jeweler's conventional model of the sun. The compact round head these flowers form has been recognized in the botanical name of the bush: *Cephalanthus*, which is Greek for "head-flower."

Sometimes again, a flower that is beautiful in the bunch is also beautiful when taken out and enlarged separately. Prof. Rogers has demonstrated this well with his top-view enlargement of a single flower of the mountain laurel. This picture brings in a third element, mathematics, to join already companioned art and botany, for it is a vivid demonstration of what might be termed the "decimal perfection" of this blossom.

Finds the Value

And so Prof. Rogers goes, from picture to picture, from flower to flower. In his work, one must find the value and bring it out, as the skilled Chinese jade-carver or the Italian maker of cameos can project imagination into patterned stone, to bring out patterns that are not obvious to the hasty passing eye. But he does it. With deft fingers, keen dissecting scalpel, and proper lenses for his camera he does it, and the result is beauty.

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Science News Letter, April 4, 1936

A device has been invented to prevent ice from forming in the carburetor of an airplane engine.

A sociologist reports that women are less affected in morale by going on relief than men are.

AGRICULTURE-CHEMISTRY

Vast Power from Atoms Hopeless for Industrial Uses

WITH GRADUAL depletion of oil reserve, man will have to depend more and more upon solar energy stored in coal and organic products of the soil plus water power, Dr. Robert A. Millikan, of California Institute of Technology, told 250 western states scientists, research workers and agricultural and industrial leaders at the Farm Chemurgic Council's Western Conference at Fresno, Calif.

Dr. Millikan predicted increased efficiency in the utilization of energy derived from coal and from farm products as experience and scientific research point the way. Deriving vast power from breaking up the atom was placed by Dr. Millikan in the laboratory category and not in the field of industrial practice.

The symposium of scientific progress in Pacific Coast industries using mainly products of farms and orchards revealed that science, in practically all instances, has led the way to economies in manufacture and profits. Wastes are being converted into staple products widely distributed throughout the nation, and this, in many instances, represents the difference between loss and profit.

Concentration in volume of surplus farm products is essential to successful operation of an alcohol industry, Louis S. Wetmore of Libby, McNeill and Libby, San Francisco, said. Sugar beets, potatoes and other starch commodities must be delivered in quantities to assure at least 65 per cent operation of plant capacity throughout the year. The remaining 35 per cent might well come from surplus or cull fruits in the West.

Doubts as to the practicability of obtaining alcohol from cull fruits and vegetables were expressed by Charles S. Ash, chief chemist of California Packing Corporation, San Francisco, who said that water content up to 85 per cent is a serious obstacle in processing.

Emory E. Smith, pioneer San Francisco consulting engineer, reviewed the beginnings of many of Pacific Coast's leading industries which have been developed into profitable enterprises through scientific research. Among these he cited oil refining, conversion of wastes from citrus, peaches, raisins and lumber into widely distributed

products, gassing of green oranges to give them a golden glow, removal of a gum from ramie grass which previously had prevented its use in textile manufacture, feasibility of growing cork oaks in this region, and production of perfumes and pyrethrum.

Charles S. Knight, industrial director of California State Chamber of Commerce, San Francisco, commended the Farm Chemurgic Council movement for bringing together industry and agriculture which, he said, should be studied in a survey wherein industries would indicate how they could be aided by specific research.

Tung Plantings

Fifteen thousand acres in Texas and Louisiana are being planted to tung trees this year under carefully controlled advance studies, as a result of the Farm Chemurgic movement, Victor H. Schoffelmayer, Agricultural Editor of the *Dallas News*, reported to the conference. Other thousands of acres will be devoted to new plantings of soybeans in the Texas areas, Mr. Schoffelmayer said.

The tung plantings are being restricted to areas where necessarily acid soil conditions prevail, where temperature and water table situations correspond to those required for successful growth of the trees. A tung oil conference was held at Beaumont last October.

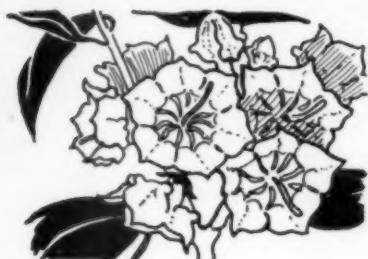
Mr. Schoffelmayer also reported that Texas cotton oil interests, in a recent meeting in Clarksville, gave assurance that they would pay farmers several dollars a ton premium for soybeans as over cottonseed.

"Texas cotton oil mill operators, in order to keep their mills running," Mr. Schoffelmayer said, "have had to import from India, Russia, Manchuria, Argentina and other countries thousands of tons of soybean and other competing oilseeds. Texas can and will supply these raw materials. The cotton oil industry is anxious to utilize the merits of the soybean as a new source of raw material."

Science News Letter, April 4, 1936

Nine flies out of ten found in or near dwellings are common house-flies.

ECOLOGY NATURE RAMBLINGS by Frank Thone



"It's the Water"

WHEN you go into a strange part of the country for a more or less prolonged stay, you may find yourself uneasy and out of sorts for a while. People explain this maladjustment vaguely, because nobody understands it at all well as yet. If you do not sleep well, they say it's the change of air. If your digestion doesn't work quite right, they blame it on the change of water.

Presently you become acclimated and forget about it. If you don't, you pack up and leave, lest you should get seriously ill and maybe die.

Plants as well as people have to meet this complex of little-understood environmental conditions. Some plants, like some people, are very tolerant and easily adjustable, so that you will find them pretty much everywhere, either as native vegetation, introduced weeds or man-transported crops.

But most forms of plant life have limits to their ability to adjust themselves, and if they stray into surroundings where their requirements are not reasonably well met they just don't grow. They are unluckier than human beings or animals in that they cannot pack up and leave if they don't like a place; all they can do is protest by perishing. Their seeds either fail to germinate, or if they do they send up feeble and pindling sprouts that are soon pushed under in the scramble for

sunlight by more vigorous neighbors.

To take a concrete example, it is because of an apparent need for an acid soil that plants of the heath family, which includes blueberries, huckleberries, mountain laurel, rhododendron and many other fine small fruits and ornamental shrubs, will not grow in the Corn Belt states. The soil there is rich in limestone, and its water is neutral or slightly alkaline. Without their daily sip of acid the heath plants cannot survive. So Illinois and Iowa have to get along without rhododendrons, and must import the "makings" for blueberry pies.

Science News Letter, April 4, 1936

PHYSIOLOGY

Vitamin B May Play Part In Body's Fat Production

A NEW role for vitamin B, helping the body gain weight by building up fat, is suggested by experiments reported by Drs. Dorothy V. Whipple and Charles F. Church, of the University of Pennsylvania School of Medicine, at the meeting of the American Society of Biological Chemists.

Animals given diets that contained no fat but plenty of vitamin B were able to gain more weight than their mates on the same fat-free diet but without the vitamin. Comparing the average body composition of the animals, the Philadelphia investigators found that fat accounted for half the gain in weight made by the animals on the vitamin diet. Water accounted for the other half of the weight gain.

The figures, they reported, suggest the possibility that vitamin B plays a role in the building up of fat in the animal body.

Vitamin B is found in moderate amounts in most natural foods, but its chief sources are wholemeal cereals, yeast, peas, beans, egg yolk, nuts, liver, kidney and heart. Lack of this vitamin causes beri-beri, a disease mostly found in the Orient, but which can occur anywhere if this vital food factor is omitted from the diet.

Consequently, fat persons cannot hope to lose weight by omitting vitamin B from their diet, even if the investigations reported today are confirmed and the vitamin is found actually to be important in weight-building. But thin persons wanting to gain weight may in the future be advised to add liberal amounts of the vitamin to their diet.

Science News Letter, April 4, 1936

CHEMISTRY "OUT OF THE TEST TUBE"

by
Dr. Harry N. Holmes

Dr. Holmes, professor of Chemistry at Oberlin College, is internationally known as "the teacher of teachers." He is one of the world's most distinguished scientists, a past Division Chairman of the American Chemical Society, and author of 10 standard works on chemistry.

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PHYSICS-ASTRONOMY

Exploded Star Too Distant to Check Cosmic Ray Origin

SCIENTISTS studying cosmic rays are diligently watching for a possible increase in the intensity of radiation coming from the constellation of Virgo where Dr. Edwin Hubble and his assistant, Glenn Moore, have discovered a giant super-nova, or exploding star.

Prof. Fritz Zwicky, of California Institute of Technology, and Dr. Walter Baade, of Mount Wilson Observatory, suggested two years ago that such star eruptions might well be the origin of cosmic rays. Scientists have been waiting, ever since, for the discovery of a new super-nova so that any possible increase in cosmic radiation intensity from the direction of the star might be noted.

At the California Institute of Technology the experimental program to test the Zwicky-Baade suggestion is going forward but the hope of proving or disproving the hypothesis with the present super-nova is none too good.

In a statement to Science Service, Prof. Zwicky explains why. He says:

Relatively Small

"The present super-nova is a relatively small object, as super-novae go. Its distance (6,000,000 light years) is extremely great. It comes, in our latitude, only within 45 degrees of the zenith. That means it passes overhead somewhat north of the equator where the magnetic field of the earth greatly reduces all directional cosmic ray effects."

The latest super-nova, however, Prof. Zwicky points out, has already fulfilled some of the two-year-old predictions contained in the Zwicky-Baade paper.

One prediction was that the rate of expansion of the exploding super-nova stars should be much higher than the 1,500 kilometers per second common to such ordinary nova stars as Nova Persei and Nova Aquilae.

"The present super-nova," states Prof. Zwicky, "indeed shows a speed of expansion equal to about 6,500 kilometers a second, in very close accordance with our quantitative predictions."

Another prediction of Dr. Baade and Prof. Zwicky was that in every galaxy on the average one super-nova or exploding star should appear every 1,000 years.

"Observers at the Mount Wilson Observatory and at the California Institute of Technology," states Prof. Zwicky, "have watched constantly about 500 galaxies in the Virgo cluster over a period of two years, starting March, 1934, until now. One super-nova was found in this period which checks very closely our estimate concerning the frequency of appearance of super-novae."

While the present super-nova in Virgo is too far away to check the idea that cosmic rays originate there, calculations nevertheless indicate to Prof. Zwicky that extremely energetic particles, with energy at least equal to 100,000,000 electron volts, have been ejected from the great stellar explosion witnessed from Mount Wilson. Prof. Zwicky considers that the hypothesis that cosmic rays originate in super-novae has therefore found at least an indirect verification.

Science News Letter, April 4, 1936

CHEMISTRY

Details Reported on New German Synthetic Rubber

SLOWLY further details of the new German synthetic rubber are arriving in the United States from sources other than the official news agencies of the Third Reich.

In the current issue of *Chemical and Metallurgical Engineering*, the magazine's Berlin correspondent reports that the new manufactured rubber, known as Buna and the product of the great German chemical combine I.G., is quite different from the wartime German attempts at making a rubber substitute.

Reports the Berlin correspondent, "Without attempting to go into details, the process for producing 'Buna,' goes back to the earlier development of acetylene and converting it into butadiene. The latter is changed by polymerization into three forms of synthetic rubber."

The basic acetylene is obtained from lime and coal.

The most widely known American synthetic rubber, Duprene, appears, therefore, to be a different type of chemical compound, since an essential stage in Duprene's manufacture involves the placing of chlorine atoms on the large molecule. The substance resulting is known as chloroprene which, on standing a few days, turns to a stiff,

jelly-like substance. The jelly mass can be made into Duprene by merely vulcanizing it for five minutes at 114 degrees Centigrade.

What the German Buna rubber will cost is difficult to determine. Statements have been made that it will sell for less than any foreign product of similar properties. A cost from 60 to 80 per cent above natural rubber is one claim.

Since natural rubber has been selling for about 13 cents a pound for the last two years the cost of Buna might, therefore, be about 24 cents a pound. The word "might" is used advisedly. One undetermined factor is the subsidization of the I.G. chemical works in the development of the material.

Claims for Buna rubber are startling: 30 per cent greater wear in automobile tires made from it is among them. Slower deterioration with age and more resistance to heat are others.

Science News Letter, April 4, 1936

● RADIO

April 7, 3:15 p.m., E.S.T.

THREE IMPORTANT INITIALS—U. S. P.—Dr. E. Fullerton Cook of the Philadelphia College of Pharmacy.

April 14, 3:15 p.m., E.S.T.

CRIME LABORATORIES—Dr. Wilmer Souder of the National Bureau of Standards.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

Ancient Rome knew the "modern" problem of indigent wanderers, and a proclamation by Emperor Caracalla, 215 A.D., ordered Egyptians of this type driven out of Alexandria, because they disturbed the city.

•First Glances at New Books

Psychology

TEXTBOOK OF ABNORMAL PSYCHOLOGY—Roy M. Dorcus and G. Wilson Shaffer—*Williams & Wilkins*, 389 p., \$4. A book by and for psychologists. As the authors state in the preface, they "have attempted to approach the discussion of abnormal phenomena through consideration of the normal. The symptoms and behavior of the abnormal individuals are not seen as completely new or mysterious ways of reacting but are recognized as exaggerated manifestations of normal functioning."

Science News Letter, April 4, 1936

Radio

RADIO RECEIVING AND TELEVISION TUBES, Third Ed.—James A. Moyer and John F. Wostrel—*McGraw-Hill*, 635 p., \$4. Latest revision of a most popular book on the application of vacuum tubes in industry. The new five, six and more element tubes which combine what formerly was the function of two tubes into one unit, and the new all-metal tubes, are described among other additions in this completely rewritten volume.

Science News Letter, April 4, 1936

Physics

NEW WORLD PICTURE—George W. Gray—*Little, Brown*, 402 p., \$3.50. Pleasingly written account of the happenings in modern physical science from the outposts of the astronomical world to the innermost parts of the atom. Mr. Gray had each chapter checked by a distinguished list of scientists to insure accuracy.

Science News Letter, April 4, 1936

Aeronautics

LIQUID-PROPELLANT ROCKET DEVELOPMENT—Robert H. Goddard—*Smithsonian Institution*, 10 p., 11 plates, 25c. See SNL, March 28, p. 201.

Science News Letter, April 4, 1936

Taxonomy

PROCEDURE IN TAXONOMY—Edward T. Schenk and John H. McMaster—*Stanford Univ. Press*, 72 p., \$2. Most students of the life sciences get through their formal schooling without any clear idea of why and how particular names are given to particular organisms; they take their taxonomy pretty much on faith. This is not a healthy state of affairs, and it is well that a compact, brief, logically de-

veloped treatise like the present work has been made available. In addition to the main text, the book includes, in the appendix, the rules of zoological nomenclature and summaries of opinions rendered by the International Commission on Zoological Nomenclature.

Science News Letter, April 4, 1936

Penology-Psychology

I KNEW THEM IN PRISON—Mary B. Harris—*Viking*, 407 p., \$3. An informally written description of the problems, difficulties, and inspiring successes attached to the task of salvaging human material coming to the doors of prisons.

Science News Letter, April 4, 1936

Chemistry

QUALITATIVE ANALYSIS—H. S. Moodey—*Chem. Pub. Co. of N. Y., Inc.*, 182 p., \$3. A British text by the Science Master of Hampton Grammar School. This means it is almost of college freshman caliber in the U. S. A.

Science News Letter, April 4, 1936

Statistics

GRAPHS, HOW TO MAKE AND USE THEM—Herbert Arkin and Raymond R. Colton—*Harper*, 224 p., 141 illus., \$3. Detailed explanation of the ways graphs are constructed from the time the blank sheet of paper is put on the drawing board until the ultimate message comes off the table. The book contains information on the different types of graphs, including scientific, industrial and pictorial.

Science News Letter, April 4, 1936

Metallurgy

MODERN USES OF NONFERROUS METALS—Ed. by C. H. Mathewson—*American Institute of Mining and Metallurgical Engineers*, 427 p., \$3. Twenty-one chapters by twenty-one authoritative writers on the ways metals other than those of the iron group enter into modern industry and civilization.

Science News Letter, April 4, 1936

Aeronautics

BIBLIOGRAPHY OF AERONAUTICS, 1932—Paul Brockett—*Govt. Print. Off.*, 296 p., 50c.

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Forestry

PROFESSIONAL FORESTRY SCHOOLS REPORT . . . 1934-35—H. H. Chapman—*Society of Amer. Foresters*, 174 p., \$1.50. With this country committed to a program of reforestation, and even getting rather excited about it, the profession of forester should be decidedly on the up-grade during the next couple of decades. Schools of forestry now existing will need to put their plants in order for more efficient handling of the undergraduate grist that will be fed into their hoppers, and new schools will doubtless be established. This situation makes Dean Chapman's study timely and valuable. He has made a critical examination of all American schools of forestry, putting it on a quantitative-grading basis for all possible points. The outcome is illuminating, for both the strengths and the weaknesses of many institutions. Already, as a result of a preliminary publication of some of the material, several institutions have begun effectual overhauls of their equipment and curricula.

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Education

SALARIES IN LAND-GRANT COLLEGES, NOT INCLUDING INSTITUTIONS FOR NEGROES, 1935—Walter J. Greenleaf—*U. S. Office of Education*, 18 p. Free upon direct application to U. S. Office of Education, Washington, D. C. A bulletin in which many teachers, even outside the special group of institutions here discussed, will be much interested—times being what they are.

Science News Letter, April 4, 1936

Botany

PRACTICAL PROBLEMS IN BOTANY—Wilfred W. Robbins and Jerome Isenbarger—*Wiley*, 402 p., \$2. The approach of this textbook is exactly that implied in the title. The facts of plant science are presented as answers to a series of questions. They go beyond the usual scope of elementary textbook information, pointing out significances in both the material and ethical relationships of everyday life.

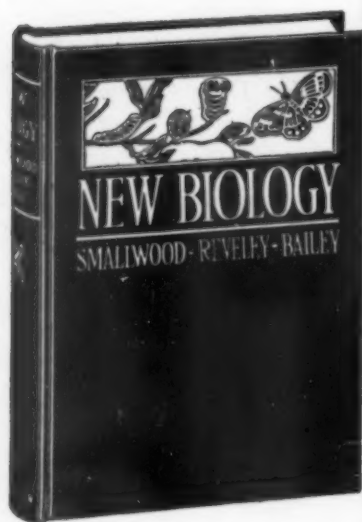
Science News Letter, April 4, 1936

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BIOLOGY: How does it Educate?

GENERAL biology offers the pupil a dramatic experience in a new realm of interest, with new tools and a new point of view.

For the young pupil there is romance in the discoveries of great biologists which have done so well to benefit humankind,—in the persistent warfare which the quiet Pasteur waged against disease, in Harvey's tireless effort which resulted in the discovery of the life-stream, in Koch's activities which resulted in the increasing control of the white plague.

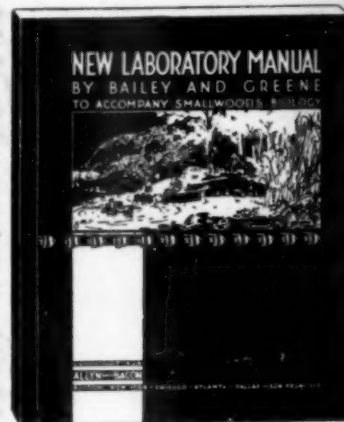


In general, biology is the study of the fundamental functions of living things, thus enriching the student's own life; in particular, it is the creating of scientific attitudes toward ourselves and our living environment. It parallels in its objectives the cardinal aims of education.

The biological unit is the *living* individual. It is through the study of the life processes common to all living things that the fundamental facts of human living are learned. Out of this mass of old and new facts comes the knowledge of the interrelationship of man to the plant

and animal world. The need for conservation of plant and animal life and the need of development and improvement of all living organisms result as a natural corollary.

The textbook is the medium for transmitting facts. It should not only teem with facts, but it must provide a program of pupil activities. It must furnish plenty of indoor laboratory work for the discovering of facts and proof, and field work for stimulating interest in life processes. It must emphasize Health by establishing habits of physical and mental well-being; Vocation by discovering interests and aptitudes as a help in vocational guidance; Leisure by developing leisure-time activities; Citizenship by presenting situations which have direct bearing on home life, group conduct, and human service.



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